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# Vitamin D and COVID-19

## Recommendation

There are insufficient data to recommend either for or against the use of vitamin D for the prevention or treatment of COVID-19.

## **General Information about Vitamin D**

Vitamin D is critical for bone and mineral metabolism. Vitamin D is also synthesized by immune system white blood cells and has the potential to modulate immune responses.<sup>1</sup>

Vitamin D deficiency (defined as a serum concentration of 25-hydroxyvitamin D ≤20 ng/mL) is common in the United States, particularly among persons of Hispanic ethnicity and Black race. These groups are overrepresented among cases of COVID-19 in the United States.<sup>2</sup> Vitamin D deficiency is also more common in older patients and patients with obesity and hypertension; all additional factors associated with worse outcomes in patients with COVID-19.

In observational studies, low vitamin D levels have been associated with an increased risk of community-acquired pneumonia in older adults<sup>3</sup> and children.<sup>4</sup> Vitamin D supplements may increase the level and activity of white blood cells called T regulatory cells in healthy individuals and patients with autoimmune diseases.<sup>5</sup> In a large analysis of several randomized clinical trials, vitamin D supplementation was shown to protect against acute respiratory tract infection.<sup>6</sup> However, in two randomized, double-blind, placebo-controlled clinical trials, administering high doses of vitamin D to critically ill patients with vitamin D deficiency (but not COVID-19) did not reduce the length of hospital stay or the mortality rate (number of people who died) when compared to placebo.<sup>7,8</sup>

High levels of vitamin D may cause dangerously high levels of calcium in the body (hypercalcemia) and accumulation of calcium in the kidneys, which can lead to kidney stones and damage (nephrocalcinosis).<sup>9</sup>



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## **Vitamin D and COVID-19**

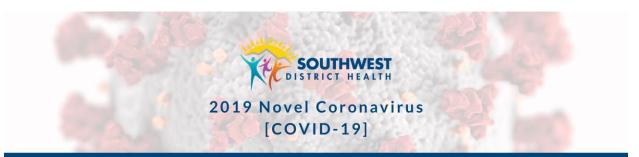
The role of vitamin D supplementation in the prevention or treatment of COVID-19 is presently not known. The rationale for using vitamin D is based largely on its general immune system modulating effects, which could potentially protect against COVID-19 infection and/or decrease the severity of illness. Ongoing observational studies are evaluating the role of vitamin D in preventing and treating COVID-19. Also, investigational trials on the use of vitamin D in people with COVID-19 are being conducted. These trials are evaluating vitamin D alone, or in combination with other agents, to participants with and without vitamin D deficiency. The latest information on these clinical trials can be found on *ClinicalTrials.gov*.

If you are considering taking vitamin D supplement for general immune system health, the recommended daily dose is vitamin D3 (cholecalciferol), 600-800 international units (IU), taken once daily.

A common approach is to check your vitamin D levels first to determine if you need to take a supplement; this requires a blood test ordered by your healthcare provider.

Vitamin D is naturally available in many healthy food choices, and is synthesized by your body when your skin is exposed to sunlight.

Always talk to your healthcare provider first before starting vitamin D or any other over-the-counter supplements.



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## References

- 1. Aranow C. Vitamin D and the immune system. *J Investig Med*. 2011;59(6):881-886. Available at: <a href="https://www.ncbi.nlm.nih.gov/pubmed/21527855">https://www.ncbi.nlm.nih.gov/pubmed/21527855</a>.
- 2. Forrest KY, Stuhldreher WL. Prevalence and correlates of vitamin D deficiency in US adults. *Nutr Res.* 2011;31(1):48-54. Available at: <a href="https://www.ncbi.nlm.nih.gov/pubmed/21310306">https://www.ncbi.nlm.nih.gov/pubmed/21310306</a>.
- 3. Lu D, Zhang J, Ma C, et al. Link between community-acquired pneumonia and vitamin D levels in older patients. *Z Gerontol Geriatr*. 2018;51(4):435-439. Available at: https://www.ncbi.nlm.nih.gov/pubmed/28477055.
- 4. Science M, Maguire JL, Russell ML, Smieja M, Walter SD, Loeb M. Low serum 25-hydroxyvitamin D level and risk of upper respiratory tract infection in children and adolescents. *Clin Infect Dis*. 2013;57(3):392-397. Available at: <a href="https://www.ncbi.nlm.nih.gov/pubmed/23677871">https://www.ncbi.nlm.nih.gov/pubmed/23677871</a>.
- 5. Fisher SA, Rahimzadeh M, Brierley C, et al. The role of vitamin D in increasing circulating T regulatory cell numbers and modulating T regulatory cell phenotypes in patients with inflammatory disease or in healthy volunteers: a systematic review. *PLoS One*. 2019;14(9):e0222313. Available at: https://www.ncbi.nlm.nih.gov/pubmed/31550254.
- 6. Martineau AR, Jolliffe DA, Hooper RL, et al. Vitamin D supplementation to prevent acute respiratory tract infections: systematic review and meta-analysis of individual participant data. *BMJ*. 2017;356:i6583. Available at: <a href="https://www.ncbi.nlm.nih.gov/pubmed/28202713">https://www.ncbi.nlm.nih.gov/pubmed/28202713</a>.
- 7. Amrein K, Schnedl C, Holl A, et al. Effect of high-dose vitamin D3 on hospital length of stay in critically ill patients with vitamin D deficiency: the VITdAL-ICU randomized clinical trial. *JAMA*. 2014;312(15):1520-1530. Available at: https://www.ncbi.nlm.nih.gov/pubmed/25268295.
- 8. National Heart Lung and Blood Institute PCTN, Ginde AA, et al. Early high-dose vitamin D3 for critically ill, vitamin D-deficient patients. *N Engl J Med*. 2019;381(26):2529-2540. Available at: <a href="https://www.ncbi.nlm.nih.gov/pubmed/31826336">https://www.ncbi.nlm.nih.gov/pubmed/31826336</a>.
- 9. Ross AC, Taylor CL, Yaktine AL, Del Valle HB, eds. *Dietary Reference Intakes for Calcium and Vitamin D*. Washington (DC): National Academies Press (US); 2011. Available at: <a href="https://www.ncbi.nlm.nih.gov/books/NBK56070/">https://www.ncbi.nlm.nih.gov/books/NBK56070/</a>.



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